Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): In a packet switched computer network, a method of estimating periodic worst-case delay for a class of traffic ~~aggregate~~ having an associated rate, the method comprising:

collecting traffic data at a queue of a router over a time interval, said queue associated with the class of traffic ~~aggregate over a time interval~~, the traffic data comprising packet size and arrival time of each packet arriving at the queue during the time interval;

calculating a burst-rate traffic profile responsive to the traffic data collected at said queue over ~~said~~ the time interval and the associated rate, wherein the associated rate is a specified bandwidth for the class of traffic ~~aggregate~~ and calculating the burst-rate traffic profile comprises calculating a burst parameter based on the associated rate; and

calculating a periodic worst-case delay for the burst-rate traffic profile by dividing the calculated burst parameter by a share of output link bandwidth allotted to said queue ~~, wherein the share of output link bandwidth is greater than or equal to the associated rate~~; wherein the associated rate is set to a rate negotiated between a customer and a provider for the class of traffic.

Claim 2 (canceled).

Claim 3 (canceled).

Claim 4 (canceled).

Claim 5 (canceled).

Claim 6 (canceled).

Claim 7 (canceled).

Claim 8 (canceled).

Claim 9 (previously presented): In a packet switched network, a method of estimating worst-case queuing delay along a path, said path comprising routers, the method comprising:

periodically collecting a rate parameter and a burst parameter associated with a queue for each of a plurality of routers, the burst parameter calculated based on a specified bandwidth;

calculating a periodic worst-case delay associated with the rate and burst parameters for said each of a plurality of routers, wherein calculating a periodic worst-case delay comprises dividing the burst parameter by a share of output link bandwidth allotted to the queue, wherein the share of output link bandwidth is greater than or equal to the specified bandwidth; and

adding up the calculated periodic worst-case delay associated with the routers along the path.

Claim 10 (canceled).

Claim 11 (currently amended): In a packet switched network, a method of estimating periodic worst-case queuing delay for a class of traffic at a router, the class of traffic having a negotiated rate, the method comprising:

receiving packets at an input interface of a router;

sending each packet to one of a plurality of streams responsive to a customer identification;

sending each packet in at least one of the plurality of streams to one of a plurality of queues responsive to a class field, each of said plurality of queues having an associated rate;

monitoring an arrival time and size of said each packet at the one of the plurality of queues during an interval of time;

~~calculating a burst parameter based on the negotiated rate;~~

calculating a burst-rate traffic profile responsive to the arrival time and size of said each packet and the negotiated rate, wherein calculating a burst-rate traffic profile comprises calculating a burst parameter based on the negotiated rate; and

calculating a periodic worst-case delay for the burst-rate traffic profile by dividing the burst parameter by an output link capacity allotted to the queue corresponding to the class of traffic, ~~the output link capacity greater than or equal to the associated rate~~.

Claim 12 (canceled).

Claim 13 (canceled)

Claim 14 (currently amended): In a packet switched network, an apparatus for estimating worst-case delay for a class of traffic aggregate having an associated rate, the apparatus comprising:

a monitor that collects traffic data comprising arrival time and size of packets arriving at a queue of a router over a time interval, said queue associated with the class of traffic aggregate over a time interval;

a processor; and

a computer readable medium coupled to the processor and storing a computer program comprising:

code that causes the processor to receive the traffic data comprising packet size and arrival time of each packet arriving at the queue during the time interval;

code that causes the processor to calculate a burst-rate traffic profile responsive to the collected traffic data and the associated rate, wherein the associated rate is a specified bandwidth for the class of traffic aggregate and code that causes the processor to calculate a burst-rate traffic profile comprises code that causes the processor to calculate a burst parameter based on the associated rate; and

code that causes the processor to calculate a periodic worst-case delay for the traffic profile by dividing the burst parameter by a share of output link bandwidth allotted to the queue, wherein the associated rate is set to a rate negotiated between a customer and a provider for the class of traffic the share of output link bandwidth is greater than or equal to the associated rate.

Claim 15 (canceled).

Claim 16 (canceled).

Claim 17 (canceled).

Claim 18 (canceled).

Claim 19 (previously presented): An apparatus as in claim 14, wherein the computer readable medium is a CD-ROM, floppy disk, flash memory, system memory, or hard drive.

Claim 20 (previously presented): In a packet switched network, an apparatus for estimating periodic worst-case queuing delay along a path, said path comprising routers, the apparatus comprising:

a monitor agent that periodically collects traffic parameters associated with a queue for each of a plurality of routers;

a processor that can receive information from the monitor agent; and

a computer readable medium coupled to the processor and storing a computer program comprising:

code that causes the processor to receive burst and rate traffic parameters collected by the monitor agent;

code that causes the processor to calculate a delay associated with the traffic parameters for said each of a plurality of routers by dividing the burst parameter by a share of output link bandwidth allotted to the queue, wherein the share of output link bandwidth is greater than or equal to the specified bandwidth; and

code that causes the processor to add up the calculated periodic worst-case delay associated with the routers along the path.

Claim 21 (canceled).

Claim 22 (previously presented): The apparatus of claim 20, wherein the computer readable medium is a CD-ROM, floppy disk, flash memory, system memory, or hard drive.

Claim 23 (currently amended): In a packet switched network, an apparatus for estimating periodic worst-case delay for a <u>class of</u> traffic <s>aggregate</s> having an associated rate, the apparatus comprising:

means for collecting traffic data comprising arrival time and size of packets arriving at a queue of a router <u>over a time interval</u>, said queue associated with the <u>class of</u> traffic <s>aggregate over a time interval</s>, the traffic data comprising packet size and arrival time of each packet arriving at the queue during the time interval;

means for calculating a burst-rate traffic profile responsive to the collected traffic data and the associated rate, wherein the associated rate is a specified bandwidth for the network and means for calculating the burst-rate traffic profile comprises means for calculating a burst parameter based on the associated rate; and

means for calculating a periodic worst-case delay for the traffic profile by dividing the burst parameter by a share of output link bandwidth allotted to said queue, wherein the <u>associated rate is set to a rate negotiated between a customer and a provider for the class of traffic</u><s>share of output link bandwidth is greater than or equal to the associated rate</s>.

Claim 24 (canceled).

Claim 25 (previously presented): In a packet switched network, an apparatus for estimating periodic worst-case queuing delay along a path, said path comprising routers, the apparatus comprising:

means for periodically collecting rate and burst traffic parameters associated with a queue for each of a plurality of routers, the burst traffic parameter calculated based on a specified bandwidth;

means for calculating a delay associated with the traffic parameters for said each of a plurality of routers by dividing the burst parameter by a share of output link bandwidth allotted to said queue, wherein the share of output link bandwidth is greater than or equal to the associated rate; and

means for adding up the calculated periodic worst-case delay associated with the routers along the path.

Claim 26 (canceled).

Claim 27 (previously presented): A computer program product for estimating periodic worst-case delay at a queue in a packet switched network, the computer program product comprising:

computer code that causes a processor to collect traffic data comprising arrival time and size of packets arriving at the queue of a router over a time interval, said traffic data having an associated negotiated rate;

computer code that causes a processor to calculate a burst traffic parameter for the collected traffic;

computer code that causes a processor to calculate a burst-rate traffic profile responsive to the collected traffic data and the associated negotiated rate;

computer code that causes a processor to calculate a periodic worst-case delay for the traffic profile by dividing the burst parameter by a share of output link bandwidth allotted to said queue, wherein the share of output link bandwidth is greater than or equal to the associated rate; and

a computer readable medium storing said computer code.

Claim 28 (canceled).

Claim 29 (previously presented): A computer program product for estimating worst-case queuing delay along a path in a packet switched network, said path comprising routers, the computer program product comprising:

computer code that causes a processor to collect burst and rate traffic parameters associated with a queue for each of a plurality of routers;

computer code that causes the processor to calculate a delay associated with the traffic parameters for said each of a plurality of routers by dividing the burst parameter by a share of output link bandwidth allotted to said queue, wherein the share of output link bandwidth is greater than or equal to the associated rate; and

computer code that causes the processor to add up the calculated delay associated with the routers along the path; and

a computer readable storage medium storing said code.

Claim 30 (canceled).

Claim 31 (previously presented): In a packet switched network, a method of estimating worst-case queuing delay along a path, said path comprising routers, the method comprising:

calculating periodic worst-case delay associated with a queue for each of a plurality of routers by dividing the burst parameter by a share of output link bandwidth allotted to said queue, wherein the share of output link bandwidth is greater than or equal to the associated rate;

periodically collecting periodic worst-case delay from said each of a plurality of routers; and

adding up the calculated periodic worst-case delay associated with the routers along the path.

Claim 32 (canceled).

Claim 33 (previously presented): The method of claim 1 wherein calculating the burst-rate traffic profile comprises utilizing a token bucket.

Claim 34 (previously presented): The method of claim 33 wherein the token bucket size corresponds to a maximum burst rate.

Claim 35 (currently amended): The method of claim 33 wherein a replenishment rate of the token bucket is based on the associated rate.

Claim 36 (previously presented): The method of claim 1 wherein the burst parameter is calculated utilizing token buckets and the associated rate is set to a negotiated rate for a specified class of traffic.

Claim 37 (previously presented): The method of claim 1 wherein the associated rate is a maximum average bandwidth specified in a service level agreement.

Claim 38 (previously presented): The method of claim 1 wherein the burst-rate traffic profile comprises a y-intercept corresponding to the calculated burst parameter and a slope corresponding to the associated rate.

Claim 39 (previously presented): The method of claim 1 further comprising calculating a cumulative bandwidth profile having a slope equal to allocated bandwidth.

Claim 40 (previously presented): The method of claim 1 further comprising calculating error of data by comparing collected data to the burst-rate traffic profile.

Claim 41 (previously presented): The method of claim 40 further comprising calculating a new burst parameter if the error of data is higher than a predetermined limit.

Claim 42 (previously presented): The apparatus of claim 14 wherein code that causes the processor to calculate the burst-rate traffic profile comprises code that causes the processor to utilize a token bucket.

Claim 43 (previously presented): The apparatus of claim 42 wherein the token bucket size corresponds to a maximum burst rate.

Claim 44 (currently amended): The method of claim 9 wherein the burst parameter is calculated utilizing token buckets ~~and the associated rate is set to a negotiated rate for a specified class of traffic~~.

Claim 45 (previously presented): The method of claim 9 wherein the rate parameter is a rate agreed to by a customer sending the traffic data.

Claim 46 (previously presented): The method of claim 11 further comprising calculating error of data by comparing collected data to the burst-rate traffic profile.

Claim 47 (previously presented): The apparatus of claim 23 wherein the burst-rate traffic profile comprises a y-intercept corresponding to the calculated burst parameter and a slope corresponding to the associated rate.

Claim 48 (new): The apparatus of claim 14 wherein said share of output link bandwidth allotted to said queue comprises a hypothetical bandwidth allocation.

Claim 49 (new): The apparatus of claim 14 wherein the negotiated rate comprises a hypothetical negotiated rate.

Claim 50 (new): The method of claim 1 further comprising calculating a hypothetical bandwidth allocation for said queue based on a specified periodic worst-case delay.

Claim 51 (new): The method of claim 11 further comprising transmitting said calculated periodic worst-case delay to a central device configured to collect said calculated periodic worst-case delay from routers along a path in the network and add up the collected periodic worst-case delay associated with each of the routers.